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ABSTRACT

As part of a series on a study of the learning disabled (LD) secondary student's environment, the document details findings on health and medical factors surrounding LD adolescents. Study participants included 234 LD, 222 low achieving (LA), and 215 normal achieving (NA) students and their parents. Data were collected from interviews with students and from parent instruments. Data included direct/related birth indices, neonatal medical/health status, childhood medical/health status, and present medical/health and nutritional status. Among findings were that there were few differences among the LD, LA, and NA groups in their medical/health histories, that mothers of LD adolescents reported a greater frequency of taking prescribed medication during pregnancy; that nutritional status of the LD and LA groups was lower than the NA group; and that NA adolescents had a greater frequency of presently taking medication than LD adolescents. Tables with statistical data from questionnaire responses make up more than half the document. (SB)

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AN EPIDEMIOLOGICAL STUDY OF LEARNING DISABLED ADOLESCENTS IN SECONDARY SCHOOLS: HEALTH AND MEDICAL FACTORS

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Research Report No. 15

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The University of Kansas Institute for Research in Learning Disabilities is supported by a contract (#300-77-0494) with the Bureau of Education for the Handicapped, Department of Health, Education, and Welfare, U. S. Office of Education, through Title VI-G of Public Law 91-230. The University of Kansas Institute, a joint research effort involving the Department of Special Education and the Bureau of Child Research, has specified the learning disabled adolescent and young adult as the target population. The major responsibility of the Institute is to develop effective means of identifying learning disabled populations at the secondary level and to construct interventions that will have an effect upon school performance and life adjustment. Many areas of research have been designed to study the problems of LD adolescents and young adults in both school and non-school settings (e.g., employment, juvenile justice, military, etc.)

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Cooperating Agencies

Were it not for the cooperation of many agencies in the public and private sector, the research efforts of The University of Kansas Institute for Research in Learning Disabilities could not be conducted. The Institute has maintained an on-going dialogue with participating school districts and agencies to give focus to the research questions and issues that we address as an Institute. We see this dialogue as a means of reducing the gap between research and practice. This communication also allows us to design procedures that: (a) protect the LD adolescent or young adult, (b) disrupt the on-going program as little as possible, and (c) provide appropriate research data.

The majority of our research to this time has been conducted in public school settings in both Kansas and Missouri. School districts in Kansas which are participating in various studies include: United School District (USD) 384, Blue Valley; USD 500, Kansas City; USD 469, Lansing; USD 497, Lawrence; USD 453, Leavenworth; USD 233, Olathe; USD 305, Salina; USD 450, Shawnee Heights; USD 512, Shawnee Mission, USD 464, Tonganoxie; USD 202, Turner; and USD 501, Topeka. Studies are also being conducted in Center School District and the New School for Human Education, Kansas City, Missouri; the School District of St. Joseph, St. Joseph, Missouri; Delta County, Colorado School District; Montrose County, Colorado School District; Elkhart Community Schools, Elkhart, Indiana; and Beaverton School District, Beaverton, Oregon. Many Child Service Demonstration Centers throughout the country have also contributed to our efforts.

Agencies currently participating in research in the juvenile justice system are the Overland Park, Kansas Youth Diversion Project and the Douglas, Johnson, and Leavenworth County, Kansas Juvenile Courts. Other agencies have participated in out-of-school studies--Achievement Place and Penn House of Lawrence, Kansas, Kansas State Industrial Reformatory, Hutchinson, Kansas; the U.S. Military; and the Job Corps. Numerous employers in the public and private sector have also aided us with studies in employment.

While the agencies mentioned above allowed us to contact individuals and supported our efforts, the cooperation of those individuals--LD adolescents and young adults; parents; professionals in education, the criminal justice system, the business community, and the military--have provided the valuable data for our research. This information will assist us in our research endeavors that have the potential of yielding greatest payoff for interventions with the LD adolescent and young adult.

Acknowledgements

The process of data collection in a study as large as the Epidemiology Study is a complex one. Many research assistants spend numerous hours searching through school files, contacting teachers and parents, testing students, and scoring tests. The assistance of these individuals is gratefully acknowledged. In particular, the following individuals made major contributions to the procedures and communications with the school districts and with school personnel: Pegi Denton, Bob LaGarde, Patty Lee, Tes Mehring, Sue Nolan, John Schmidt, and Alice Vetter.

AN EPIDEMIOLOGICAL STUDY OF LEARNING DISABLED ADOLESCENTS IN SECONDARY SCHOOLS

Abstract

In recent years, professionals in the field of learning disabilities have begun to address the impact of learning disabilities on adolescents and young adults. Although substantial attention has been directed to the manifestations of learning disabilities in elementary school age populations, the significantly different and increasingly complex demands on adolescents both in and out of school necessitate the development of systematic research on this population. The University of Kansas Institute for Research in Learning Disabilities has collected a broad array of data to form an epidemiological data base on LD adolescents and young adults. Data have been collected from learning disabled, low-achieving, and normal-achieving adolescents as well as from their parents and teachers. In addition, information from the environmental setting of the LD adolescents which pertains to interventions applied on behalf of the student, relationships with others, conditions under which he/she operates and support systems available for his/her use has also been collected. These data have been considered in relation to data on specific learner characteristics to gain a more complete profile of the older LD individual.

Research results presented in Research Reports 12 through 20 detail findings from this comprehensive epidemiology study conducted during 1979-80 by the Institute. It is important for the reader to study and view each of these individual reports in relation to this overall line of research. An understanding of the complex nature of the learning disability condition only begins to emerge when each specific topic or finding is seen as a partial, but important, piece of a larger whole.

The specific aspects of the total study presented in individual Research Reports are listed below:

Research Report No. 12:	Details of the Methodology
Research Report No. 13:	Achievement and Ability, Socioeconomic Status, and School Experiences
Research Report No. 14:	Academic Self-Image and Attributions

Research Report No. 15:	Health and Medical Factors
Research Report No. 16:	Behavioral and Emotional Status from the Perspective of Parents and Teachers
Research Report No. 17:	The Relationship of Family Factors to the Condition of Learning Disabilities
Research Report No. 18:	Social Status, Peer Relationship, Activities In and Out of School, and Time Use
Research Report No. 19:	Support Services
Research Report No. 20:	Classification of Learning Disabled and Low-Achieving Adolescents

AN EPIDEMIOLOGICAL STUDY OF LEARNING DISABLED ADOLESCENTS IN SECONDARY SCHOOLS:

HEALTH AND MEDICAL FACTORS

Since the inception of the learning disability field in the early 1960s, emphasis for treatment and intervention has been on younger children. Only recently has attention been turned to addressing the educational and life adjustment needs of adolescents and young adults as well (Alley & Deshler, 1979). A prerequisite step to developing sound instructional systems and procedures for the older-aged learning disabled is for the field to achieve a thorough understanding of the complex nature of the condition of learning disabilities in older populations.

There are some unique problems related to adolescents with learning disabilities (LD) which have not been adequately addressed within the research on learning disabilities in elementary populations. Among these are the following. The demands of the curriculum in secondary schools or job requirements in employment settings are significantly different from the demands placed on LD students in elementary settings. Thus, the manifestations of the specific learning disability may be altered. Second, there are many variables associated with the condition of learning disabilities. It would appear that the complexity and interaction of these increase as the adolescent moves from school to non-school settings and as the number and variety of his/her social groupings increase (Deshler, 1978). Thirdly, there is very little knowledge about the conditions confronting the LD adolescent and young adult in

non-school settings and the degree to which these individuals can cope with these circumstances.

The complex nature of the condition of learning disabilities and the unique features of the conditions and the environment facing the LD adolescent and young adult demonstrate the need for systematic research on this population. Therefore, the purpose of a major line of research conducted by The University of Kansas Institute for Research in Learning Disabilities has been to collect a broad array of data to form an epidemiological data base on older LD populations. Data have been collected from the environmental setting of the LD adolescent which pertain to interventions applied on behalf of the student, conditions under which he/she operates, and support systems available for his/her use. These data have been considered in relation to data on specific learner characteristics to gain a more complete profile of the older LD individual.

Research results presented in Research Reports 12 through 20 detail findings from this comprehensive epidemiology study conducted during 1979-80 by the Institute. It is important for the reader to study and view each of these individual reports in relation to this overall line of research. An understanding of the complex nature of the learning disability condition only begins to emerge when each specific topic or finding is seen as a partial, but important, piece of a larger whole. This specific research report will present findings on the health and medical factors surrounding learning disabled adolescents in secondary schools.

Medical/health correlates of learning disabilities (LD) have been previously identified as one of the three major areas of LD literature (Chalfant & Scheffelin, 1969). This area of literature has continued to be of interest to investigators associated with the field of learning disabilities (Adler, 1979; Colletti, 1979). The breadth of interest within this psychobiological specialty has included interest in prenatal and birth complications (Colletti, 1979; Pasamanick & Knoblock, 1960) nutritional status (Adler, 1979; Feingold, 1976; Rapp, 1978), hyperactivity (Comly, 1971; Connors & Rothschild, 1968; Cunningham & Barkley, 1978; Firestone, Poctras-Wright, & Douglas, 1978; Weissenburger & Loney 1977), and vestibular disorders (deQuiros, 1976). This group of investigations is not exhaustive but rather representative of those studies which have appeared in the learning disabilities literature.

The studies of learning disabilities from a biological perspective have provided little direction for the researcher or clinician interested in the learning disabled adolescent. Two studies have provided either inferred or implicit psychobiological disturbances among learning disabled adolescents. Firestone, Poctras-Wright, and Douglas (1978) stated that behaviors central to hyperactivity, i.e., attention difficulties and impulse-control deficits are found in adolescents. They implied that drugs, specifically caffeine, could be used to control the adolescents' behavior. Feingold (1976) reported that behavioral disturbances (including learning disabilities) among adolescents and adults appear to be related to the "ingestion of artificial food colors and flavors" (p. 553). He noted four effects among these groups. They are:

1. A longer period on diet management is needed before behavior improvement is noted and then it is not always complete;
2. Failure of the diet management program to show behavioral improvement;
3. Spontaneous remission of behavioral problem, and
4. Inability for the adolescent to cope with environment and to perform at his/her full potential. (p. 553)

Rapp (1978) studied the effect of a diet which did not contain foods and food coloring associated with allergy and allergic-tension fatigue syndrome on 24 hyperactive children ages five to 16. Ten of the children were referred by members of the Association for Children with Learning Disabilities (ACLD). Although it is not explicitly stated, it may be assumed that these ten children were most likely classified as learning disabled. Of the 24 children, 18 reacted to dyes, foods or both. Six children showed no reaction to either test. The children were placed on a diet for seven days with food challenges introduced systematically for 12 weeks. The results showed that there was improvement in: activity in 12 children, gastrointestinal discomfort, and headaches or muscle aches in 15 children after one week. Improvements were also noted in these two areas for 12 weeks and 18 months. No mention was made in the article with regard to adolescents and one can only assume comparable test reaction results and effects of treatment between adolescents and younger children.

The major purpose of the present study is to provide an epidemiological data base of biological factors among learning disabled adolescents. The investigation was conducted comparing the medical histories provided by parents of learning disabled, low-achieving, and normal-achieving students enrolled in junior and senior high schools.

Methodology

Subjects

Three groups of adolescents and their parents participated in this part of the study. The adolescents included LD students, low-achieving students, and normal-achieving students in grades 7, 8, 9, 10, 11, and 12. LD students were those currently being served in programs for learning disabled students and validated by the IRLD Validation team. Low-achieving (LA) students were students who had recently received one or more failing grade in required subjects, scored below the 33rd percentile on group administered achievement tests, and who were not receiving special educational services. Normal-achieving (NA) students were those who had passing grades, scored above the 33rd percentile in achievement, and who were not receiving special educational services. The students and their parents agreed to participate in this study. For more details on student selection, see The University of Kansas Institute for Research in Learning Disabilities Research Report No. 12 (Schumaker, Warner, Deshler, & Alley, 1980). Two hundred thirty-four LD students and 162 of their parents, 222 low-achieving students and 144 of their parents, and 215 normal-achieving students[1] and 184 of their parents took part.

Settings

Three school districts in northeast Kansas agreed to participate (USDs #500, #512, and #202). The students provided information for this study in small, quiet rooms selected by their schools. Parents provided information at their leisure at home. (For more information regarding settings see Schumaker et al., 1980.)

Measurement Systems

Two assessment instruments, the Youth Instrument and the Parent Instrument, were utilized in this analysis. Both instruments were designed with a number of questions regarding medical and health status and history of the target groups. A number of different answer formats used in the questions. Some involved Likert-type scales, others involved multiple-choice answers, and still others allowed open-ended responding. (For more information about the instruments see Schumaker et al., 1980.)

Procedures

In individual sessions, the students were read the questions (and possible answers) by an interviewer. The students' responses were recorded on the instrument either by the interviewer or the student, at the student's choice. The parent instruments were either mailed or carried home by the students. Follow-up letters and phone calls prompted delayed returns.

Data Analysis

The Kansas University Institute for Research in Learning Disabilities Research Reports in which data from the first phase of the comprehensive Level I epidemiological study are numbered (including the present report) 12 through 20. A thorough discussion of the specific procedures used in data analysis for the complete study as a whole as well as the rationale for those procedures is contained in Research Report Number 12, Details of the Methodology. (Schumaker et al., 1980) The following comments are condensed from that report.

In general, two types of variables are discussed in Research Reports 12-20: (a) individual items from the Youth, Parent, or

Regular Teacher Assessment Instruments, or specific ability or achievement test scores and (b) FSCALES. The FSCALES were derived by equally weighting and averaging performance on two or more items from one of the assessment instruments. Based on a factor analysis of each assessment instrument, items were combined into an FSCALE if they had a moderate to strong loading on the same factor. A complete listing of the items which made up each FSCALE is contained in Research Report Number 12.

In order to test for significant group differences on individual assessment instrument items, test scores, or FSCALES, the following procedure was adopted. The BMDP7D computer program (Dixon, 1975) was used to conduct a univariate F test for each variable under consideration. For each variable, if the p value associated with F was less than or equal to .01, confidence bands for each mean were constructed. Two standard errors of the mean ($SE = SD/\sqrt{n}$) were added and subtracted from each mean. If the confidence bands for a given pair of means did not overlap, the means were considered significantly different.[2]

Results

The parents were asked to respond to a number of questions, a portion of which related to four major areas of Pregnancy and associated medical/health conditions: Direct/related birth indices, Neonatal medical/health status, Childhood medical/health status, and Present medical/health status and Nutritional status of the target adolescents. The target adolescent was also asked numerous questions. Two questions were related to his/her Present medical/health cond-

itions. The adolescent was asked to provide his/her height and weight. The data for those variables in which a significant difference was found between at least one pair of group members, i.e., LD and LA, LA and NA, LA and NA, are presented in tabular form. In each table are shown: (a) the question(s) asked and possible responses, (b) the mean ($\bar{X}$) for each group, (c) the standard deviation (SD) of the mean, (d) the range of responses, (e) the number (n) of persons responding, (f) the obtained F value, (g) the level of significance ($p < .01$), and (h) an indication (yes, no) of whether the confidence bands for each pair of groups overlapped using a 98% confidence band. If the indication was "No" then the mean scores are different between the paired groups. The 98% confidence band is a very conservative test to determine differences. This is also the case for the level of significance. These conservative criteria were chosen in view of the number of F-tests used to analyze the data. The data is presented by first collapsing across the levels of junior and senior high school adolescents. It was then analyzed by level.

Pregnancy and Associated Medical/Health Conditions

Seven variables were included in this cluster. They included: Mother's Health during Pregnancy, Cigarettes smoked during pregnancy, Number of cigarettes smoked per day, Drinking alcoholic beverages during pregnancy, Number of drinks per week, Prescribed drugs taken during pregnancy, Non-prescribed drugs taken during pregnancy. It was found that three variables yielded a significant F-test at the .01 level. When levels were collapsed they were: Mother's health during pregnancy, Cigarettes smoked during pregnancy, and Prescribed drugs taken during pregnancy. This data is shown in

Insert Tables 1, 2, and 3 about here

Tables 1, 2, and 3 respectively. It was found that the NA mothers reported fewer health problems during pregnancy than LD mothers as a group. In addition, the same two groups were differentiated by the reported use of prescribed drugs during the pregnancy. The order of difference was in the same direction as the first variable. That is more LD mothers reported having drugs prescribed during pregnancy than did the NA mothers. More LA mothers than NA mothers reported having smoked cigarettes during the pregnancy of the target adolescents (see Tables 1, 2, and 3). As might be expected, no significant findings resulted from the analysis of the three variables described above using only junior high school groups. No NA group was included at the junior high school level. It was surprising to find that only one variable, Prescribed drugs taken during pregnancy, reached the .01 level of significance (Table 4). The difference was found to be between the LD and LA groups. More of the LA mothers had not taken prescribed drugs during their pregnancy.

Insert Table 4 about here

Direct/Related Birth Indices

Five variables are included in this cluster. They include: (1) Mother's age at birth of child, (2) Length of gestation, (3) Day, (4) Month, and (5) Year of adolescent's birth. One variable

yielded a significant result. The variable, year of adolescent's birth, was expected in view of the trunkated interval of the NA group which included only senior high school students (see Table 5). As expected, this variable did not differentiate between the LD and LA groups. The results, using only senior high school data, verified the result obtained in the junior-senior high data. The LD students are, as a group, younger than the NA students. This result was unexpected (see Table 6).

Insert Tables 5 and 6 about here

Neonatual Medical/Health Status

This cluster included three variables. They are: (1) Medical problems of infant at birth, (2) Number of problems given by type, and (3) Health status of infant during first month. Only one variable, Health status of infant during first month, yielded a significant result (see Table 7). The LD group was less healthy than the NA group. No significant differences were found on this variable at either the junior high or senior high levels.

Insert Table 7 about here

Childhood Medical/Health Status

Nine variables were included in this cluster. They are: (1) Childhood illnesses or conditions, (2) Childhood diagnoses, (3) Accidents with loss of consciousness, (4) Accidents requiring hospitalization, (5) Results of accidents (in frequency), (6) Long term medi-

cation, (7) Type of Medication (frequency), (8) Glasses prescribed, and (9) Hearing aid prescribed. Significant results were obtained on three variables, i.e., Childhood diagnoses, Accidents requiring hospitalization and Glasses prescribed (Tables 8, 9, & 10). The LD group was found to have more diagnoses than either the LA or NA groups (Table 8). This might be expected as the diagnosis of learning

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Insert Tables 8, 9, and 10 about here

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disabilities is included within the possible responses. However, it can be seen to be the sole differentiating factor. More members of the LA group had required hospitalization than either the LD or the NA group. The NA group contained more members for whom glasses had been prescribed than either the LD or the LA group. The junior high only data showed that the LD members had obtained more diagnoses than the LA group (Table 11). No significant difference was found between the LD and LA groups on the number of hospitalizations after accidents. As expected, no difference was found between the LD and LA groups on the number of group members for whom glasses had been prescribed. The senior high only data reflected similar results on the number of diagnoses obtained by the LD group, as was the case in the combined junior and senior high data. The LD group abtained more diagnostic labels than either the LA or the NA group (Table 12). No significant difference(s) was/were found among the three senior high groups on hospitalization after accident(s). The NA group members had glasses prescribed to them more often than the LA senior high group but with

no greater frequency than the LD senior high group (Table 13).

Insert Tables 11, 12, and 13 about here

Present Medical/Health Status

This cluster include 14 variables. They are: (1) Food group-dairy products, (2) Food group-vegtables, (3) Food group-fruits, (4) Food group-meat/poultry, (5) Food group-grains, (6) Food group-other, (7) Eating habits, (8) Present prescribed medication, (9-10) Number of Medications, (11) Presently wear glasses, (12) Presently wear hearing aid, (13) Present height, and (14) Present weight.

Seven of the variables yielded significant differences among the three classifications when the junior and senior high school data were combined. They included: (1) Food group-dairy products, (2) Food group-Vegetables, (3) Food group-fruits, (6) Food group-other, (8) Present Prescribed Medication, (11) Presently wearing glasses, and (13) Present height (see Tables 14-20). On all of the seven

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Insert Tables 14, 15, 16, 17, 18, 19, and 20 about here

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variables the confidence bonds overlapped between the LD and the LA groups. The NA group means were different from both the LD and LA on four variables, the LA group on two variables and the LD group on one variable. The direction of difference(s) was in the expected direction, i.e., NA in absolute positive direction, on five variables. However, two unexpected differences were found. The NA group was on more presently prescribed medication than either the LD or the LA

groups (see Table 18). Also, a greater number of NA were presently wearing prescriptive glasses than either of the two groups (see Table 19).

The analysis, using only junior high school adolescents, revealed no significant difference(s) among the three groups on the seven variables. These findings were expected in view of the results of junior and senior high data. The NA group consisted only of senior high school students.

Five of the seven variables reached the .01 level of significance at the senior high school level. They included: (1) Food Group-dairy products, (2) Food Group-vegetables, (3) Food Group-other, (8) Present prescribed medication, (11) Presently wear glasses (see Tables 21-25). The results were the same as those reported for the junior and senior high data on three of the five variables (see Tables 21, 22, & 24). On one variable, Food Group-fruits, only the LA and NA means were different. The variable, taking prescribed medication now, which yielded differences that were unexpected using the junior and senior high data, resulted in confidence bonds that overlapped among all three groups.

Insert Tables 21, 22, 23, 24, and 25 about here

Variables Which Yielded No Significant Difference(s) Among the LD, LA and NA Groups

A number of variables yielded no significant differences among the three classification groups. A list of these variables is shown in Table 26. To review the specific question asked for each variable,

refer to the instruments employed. These instruments appear in Appendix C of Research Report #12.

Insert Table 26 about here

Discussion

The present investigation has demonstrated that there are few differences among the LD, LA and NA groups to be found in their medical/health histories. The differences that are apparent exist between the NA group and LD and/or LA group(s). These findings are only generalizable to the senior high school adolescents as the NA junior high school data was not included in this report. Also, the NA is an intact group, a high school band. The band has proven to be a high-achieving group in a university community.

The conclusions will be discussed according to the five life stages previously described, i.e., Pregnancy, Birth, Neonatal Childhood and Present (adolescence). It was found that mother's health during pregnancy of the LD adolescent junior high group was noted by the report of "very ill and/or confined to bed much of the time". Neither the LA nor NA group mothers endorsed that option. In addition, mothers of LD adolescents reported a greater frequency of taking prescribed medication during pregnancy. There is an implication that mothers' of LD adolescents pregnancy was more complicated than the mothers of NA adolescents.

An interesting finding was obtained when studying the birth history. The birth date reported by the parent(s) of LD adolescents

yielded a younger group of children than reported by the NA parent(s). This is contrary to common belief that LD students as a group have a greater number of retentions than NA students. However looking more closely, one finds that the year of birth for the LD adolescents ranges from 1958-1966 whereas the NA group year of birth ranges from 1960-1963. This finding is the result of two factors. First, the junior high school LD students are included in the analysis whereas the NA group contains no such data. At the neonatal stage (Birth-30 days post-partum), no consistent significant finding held across groups or school levels. It was of interest to note that only among the LD and LA groups did the parents report that the target adolescent was provided intensive care during the first 30 days.

During childhood, the LD adolescents had received a greater frequency of one or more diagnostic label(s) than either the LA or the NA group. This might be expected in view of the subject selection criterion that those adolescents classified as LD must have been diagnosed as LD by the special services of the local district. Conversely, subjects included in the LA and NA groups could not have a special services diagnostic label to be included in the study. Other findings at the childhood stage which yielded significant differences between two of the three groups failed to obtain significance when the grouped data was analyzed by school level.

The present status of the three groups yielded two important findings. First, the nutritional status of the LD and LA groups was lower than the NA group. This finding was substantiated when analyzing the senior high school data. The LD and LA families eat/drink less dairy products and vegetables than the NA group. Of interest

was that the LD group has some parents respond that dairy products and vegetables were served "less than once a week". The NA group had no parents that endorsed, "less than once a week" or " once a week" to either food group. Fruits were eaten less frequently by LD than either LA or NA adolescents. Finally, the "Food Group-other" was contaminated because the item was incorrectly presented. A clerical error was the source of contamination.

The finding that the NA adolescents had a greater frequency of presently taking medication than LD adolescents was confirmed by the senior high school analysis. However when the confidence bond criterion was applied to the senior high school means of the two groups, the differences no longer were apparent.

The findings of the present investigation provide extremely limited but positive support to previous investigators interested in the medical/health status of LD children and adolescents. The area of study which appears to be most fruitful for future research is the nutritional status of LD adolescents. The LD and LA adolescent should be eating/drinking more dairy products, vegetables and fruits. The area appears to be one related to health educators' domain.

The relationship between allergies and nutritional status was not obtained. This investigation did not support this relationship. However, it would be of interest to study the nutritional status of subgroups of LD, LA and NA adolescents whose parents stated that the adolescent had allergic reactions.

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Footnotes

1This includes 60 normal-achieving junior high students for whom data have not been analyzed to date.

2Because of the large number of means that are being compared in the epidemiology study as a whole, it is likely that some of these will be "significantly" different on the basis of sampling error alone. A cross-validation study is currently under way in an attempt to substantiate differences found in Research Reports 13-20.

TABLE 1

Parent Question: How would you describe the mother's health during pregnancy with this son/daughter?

She was very ill and confined to bed much of the time	1
She was ill and had to restrict her activities	2
She had severe morning sickness	3
She had morning sickness at first and then felt good the rest of the time	4
She was generally healthy	5
She was very healthy	6

	LD	LA	NA	Overlap
$\bar{X}$	4.471	4.897	4.949	LD & LA Yes
Parent SD	1.228	1.020	1.070	LD & NA No
Response Range (Jr. & Sr. High)	1 - 6	2 - 6	2 - 6	LA & NA Yes
	F = 8.82*			
	n = 157	n = 138	n = 180	

*$p < .001$

TABLE 2

Parent Question: Did the mother do any of the following during her pregnancy with this son/daughter?

	No	Yes
Smoke cigarettes?	1	2

		LD	LA	NA	Overlap	
	$\bar{X}$	1.325	1.377	1.229	LD & LA	Yes
Parent	SD	0.470	0.486	0.421	LD & NA	Yes
Response Range (Jr. & Sr. High)		1 - 2	1 - 2	1 - 2	LA & NA	No
		F = 4.2950*				
		n = 160	n = 138	n = 175		

*p < .01

TABLE 3

Parent Question: Did the mother do any of the following during her pregnancy with this son/daughter?

	No	Yes
Use drugs prescribed by the doctor?	1	2

		LD	LA	NA	Overlap	
	$\bar{X}$	1.471	1.333	1.308	LD & LA	Yes
Parent	SD	0.501	0.473	0.463	LD & NA	No
Response Range (Jr. & Sr. High)		1 - 2	1 - 2	1 - 2	LA & NA	Yes
		F = 5.3317*				
		n = 157	n = 132	n = 172		

*p < .01

TABLE 4

Parent Question: Did the mother do any of the following during her pregnancy with this son/daughter? (Senior High)

	No	Yes
Use drugs prescribed by the doctor?	1	2

		LD	LA	NA	Overlap	
	$\bar{X}$	1.455	1.210	1.308	LD & LA	No
Parent	SD	0.501	0.410	0.463	LD & NA	Yes
Response Range (Sr. High)		1 - 2	1 - 2	1 - 2	LA & NA	Yes
		F = 5.0506*				
		n = 77	n = 62	n = 172		

*$p < .01$

TABLE 5

Parent Question: What is this son/daughter's birthdate?

____/____/____
mo. day year

	LD	LA	NA	Overlap	
Parent	63.032[1]	63.121[1]	61.869[1]	LD & LA	Yes
Response	1.982	1.628	0.892	LD & NA	No
(Jr. & Sr. High)	58 - 67	60 - 66	60 - 63	LA & NA	No
	F = 35.0028*				
	n = 156	n = 141	n = 183		

*$p < .001$ [1]year of birth, i.e., 1961, 1963

TABLE 6

Parent Question: What is this son/daughter's birthdate?

____/____/____
mo. day year

		LD	LA	NA	Overlap
Parents	$\bar{X}$	61.416	61.765	61.869	LD & LA Yes
Response	SD	1.250	1.009	0.892	LD & NA No
(Sr. High)	Range	58 - 66	60 - 64	60 - 63	LA & NA Yes
		F = 5.4773*			
		n = 77	n = 68	n = 183	

*p < .01

TABLE 7

Parent Question: How healthy was this son/daughter during the first month of life?

Required intensive care	1
Required observation but not transferred to intensive care	2
Healthy with a few minor problems	3
Very healthy	4

		LD	LA	NA	Overlap
Parent Response (Jr & Sr High)	$\bar{X}$	3.594	3.703	3.833	LD & LA Yes
	SD	0.729	0.644	0.403	LD & NA No
	Range	1 - 4	1 - 4	2 - 4	LA & NA Yes
		F = 6.8191*			
		n = 160	n = 138	n = 180	

*$p < .001$

TABLE 8

Parent Question: Has your son/daughter ever received any of the following diagnoses?

	No	Yes
Minimal Brain Dysfunction (MBD)	1	2
Emotionally Disturbed	1	2
Hyperactive	1	2
Learning Disabled	1	2
Reading Disabled	1	2
Dyslexia	1	2
Mentally Retarded	1	2
Gifted	1	2
Aphasic	1	2
Other (Specify)	1	2

	LD	LA	NA	Overlap
Parent $\bar{X}$	1.427	0.616	0.179	LD & LA No
Response SD	1.194	0.999	0.474	LD & NA No
(Jr. & Sr. High) Range	0 - 5	0 - 4	0 - 3	LA & NA No
	F = 79.5142*			
	n = 157	n = 138	n = 184	

*p < .0001

TABLE 9

Parent Question: Has your son/daughter had any serious accidents which required hospital care?

No	Yes
1	2

	LD	LA	NA	Overlap	
Parent $\bar{X}$	1.224	1.420	1.279	LD & LA	No
Response SD	0.418	0.495	0.450	LD & NA	Yes
(Jr. & Sr. High) Range	1 - 2	1 - 2	1 - 2	LA & NA	No
	F = 7.4522*				
	n = 161	n = 143	n = 183		

*p < .001

TABLE 10

Parent Question: Have glasses ever been described for your son/daughter?

No	Yes
1	2

	LD	LA	NA	Overlap	
Parent $\bar{\bar{X}}$	1.344	1.273	1.596	LD & LA	Yes
Response SD	0.476	0.447	0.492	LD & NA	No
(Jr. & Sr. High) Range	1 - 2	1 - 2	1 - 2	LA & NA	No
	F = 21.5256*				
	n = 160	n = 143	n = 183		

*$p < .0001$

TABLE 11

Parent Question: How your son/daughter ever received any of the following diagnoses?

	No	Yes
Minimal Brain Dysfunction (MBD)	1	2
Emotionally Disturbed	1	2
Hyperactive	1	2
Learning Disabled	1	2
Reading Disabled	1	2
Dyslexia	1	2
Mentally Retarded	1	2
Gifted	1	2
Aphasic	1	2
Other (specify)	1	2

	LD	LA	Overlap
Parent $\bar{X}$	1.487	0.792	LD & LA No
Response SD	1. 136	1.125	
(Jr. High) Range	0 - 5	0 - 4	
	F = 14.3447*		

n = 80 n = 72

*p < .001

TABLE 12

Parent Question: Has your son/daughter ever received any of the following diagnoses?

	No	Yes
Minimal Brain Dysfunction (MBD)	1	2
Emotionally Disturbed	1	2
Hyperactive	1	2
Learning Disabled	1	2
Reading Disabled	1	2
Dyslexia	1	2
Mentally Retarded	1	2
Gifted	1	2
Aphasic	1	2
Other (Specify)	1	2

	LD	LA	NA	Overlap	
Parent $\bar{X}$	1.364	0.424	0.179	LD & LA	No
Response SD	1.256	0.805	0.474	LD & NA	No
(Sr. High) Range	0 - 5	0 - 4	0 - 3	LA & NA	Yes
	F = 61.2105*				
	n = 77	n = 66	n = 184		

*p < .0001

TABLE 13

Parent Question: Have glasses ever been prescribed for your son/daughter?

No	Yes
1	2

	LD	LA	NA	Overlap	
Parent $\bar{X}$	1.408	1.224	1.596	LD & LA	Yes
Response SD	0.495	0.420	0.492	LD & NA	Yes
(Sr. High) Range	1 - 2	1 - 2	1 - 2	LA & NA	No
	F = 15.7636*				
	n = 76	n = 67	n = 183		

*$p < .0001$

TABLE 14

Parent Question: About how often does your family eat the following food?

	Less than once a week	Once a week	2-3 times a week	Once a day	Twice a day	3 or more times a day
Dairy products (milk, cheese)	1	2	3	4	5	6

	LD	LA	NA	Overlap	
Parent $\bar{X}$	4.975	5.076	5.393	LD & LA	Yes
Response SD	1.024	0.862	0.686	LD & NA	No
(Jr. & Sr. High) Range	1 - 6	2 - 6	3 - 6	LA & NA	No
	F = 11.1084 *				
	n = 161	n = 144	n = 183		

*p < .0001

TABLE 15

Parent Question: About how often does your family eat the following food?

	Less than once a week	Once a week	2-3 times a week	Once a Day	Twice a day	3 or more times a day
Vegetables (peas, carrots, etc.)	1	2	3	4	5	6

	LD	LA	NA	Overlap	
Parent $\bar{\bar{X}}$	4.000	3.979	4.492	LD & LA	Yes
Response SD	0.912	1.021	0.733	LD & NA	No
(Jr. & Sr. High) (Range)	1 - 6	1 - 6	2 -6	LA & NA	No
	F = 18.4137*				
	n = 162	n = 144	n = 183		

*$p < .0001$

TABLE 16

Parent Question: About how often does your family eat the following food?

	Less than once a week	Once a week	2-3 times a week	Once a day	Twice a day	3 or more times a day
Fruits (apples, orange juice)	1	2	3	4	5	6

	LD	LA	NA	Overlap	
Parent $\bar{X}$	3.981	4.154	4.505	LD & LA	Yes
Response SD	1.184	1.252	0.985	LD & NA	No
(Jr. & Sr. High) Range	1 - 6	1 - 6	1 - 6	LA & NA	No
	F = 9.5236*				
	n = 160	n = 143	n = 182		

*p < .0001

TABLE 17

Parent Question: About how often does your family eat the following food?

Less than once a week	Once a week	2-3 times a week	Once a day	Twice a day	3 or more times a day
1	2	3	4	5	6

Other Foods (potato chips, candy, cake, sugar, pop, cereal)

	LD	LA	NA	Overlap	
Parent X	3.919	4.264	3.823	LD & LA	Yes
Response SD	1.259	1.128	1.193	LD & NA	Yes
(Jr. & Sr. High) Range	1 - 6	1 - 6	1 - 6	LA & NA	No
	F = 5.8099*				
	n = 160	n = 144	n = 181		

* $p < .01$

TABLE 18

Parent Question: Is your son/daughter taking any prescribed medication now?

No	Yes
1	2

	LD	LA	NA	Overlap	
Parent $\bar{X}$	1.088	1.042	1.158	LD & LA	Yes
Response SD	0.283	0.201	0.366	LD & NA	Yes
(Jr. & Sr. High) Range	1 - 2	1 - 2	1 - 2	LA & NA	No
	F = 6.3686*				
	n = 160	n - 143	n = 183		

*p < .01

TABLE 19

Parent Question: Have glasses ever been prescribed for your son/daughter?

No	Yes
1	2

If yes, does he/she now wear them?

No	Yes
1	2

	LD	LA	NA	Overlap	
Parent $\bar{X}$	0.531	0.420	1.121	LD & LA	Yes
Response SD	0.784	0.726	0.956	LD & NA	No
(Jr. & Sr. High) Range	0[1] - 2	0[1] - 2	0[1] - 2	LA & NA	No
	F = 34.1200*				
	n = 160	n = 143	n = 182		

*p < .0001

[1]104 LD, 103 LA and 73-NA glasses had never been prescribed

TABLE 20

Youth Question: What is your correct height? _____ft. _____ in.

	LD	LA	NA	Overlap
Youth $\bar{X}$	66.350[1]	66.646[1]	67.579[1]	LD & LA Yes
Response SD	4.729	4.388	3.946	LD & NA No
(Jr. & Sr. High) Range	51-76	50-77	59-77	LA & NA Yes
	F = 4.6875*			
	n = 226	n = 212	n = 214	

*$p < .01$

[1]in inches

TABLE 21

Parent Question: About how often does your family eat the following food?

	Less than once a week	Once a week	2-3 times a week	Once a day	Twice a day	3 or more times a day
Dairy Products (milk, cheese)	1	2	3	4	5	6

	LD	LA	NA	Overlap	
Parent $\bar{X}$	4.873	5.029	5.393	LD & LA	Yes
Response SD	1.102	0.828	0.686	LD & NA	No
(Sr. High) Range	1 - 6	2 - 6	3 - 6	LA & NA	No
	F = 12.4534*				
	n = 79	n = 68	n = 183		

*p < .0001

TABLE 22

Parent Question: About how often does your family eat the following food?

	Less than once a week	Once a week	2-3 times a week	Once a day	Twice a day	3 or more times a day
Vegetables (peas, carrots, etc.)	1	2	3	4	5	6

	LD	LA	NA	Overlap	
Parent $\bar{X}$	3.937	3.941	4.492	LD & LA	Yes
Response SD	0.911	1.049	0.733	LD & NA	No
(Sr. High) Range	1 - 6	1 - 6	2 - 6	LA & NA	No
	F = 17.2594*				
	n = 79	n = 68	n = 183		

*$p < .0001$

TABLE 23

Parent Question: About how often does your family eat the following food?

	Less than once a week	Once a week	2-3 times a week	Once a day	Twice a day	3 or more times a day
Fruits (orange juice, apples)	1	2	3	4	5	6

	LD	LA	NA	Overlap	
Parent $\bar{X}$	3.974	4.382	4.505	LD & LA	Yes
Response SD	1.151	1.159	0.985	LD & NA	No
(Sr. High) Range	1 - 6	1 - 6	1 - 6	LA & NA	Yes
	F = 6.8420*				
	n = 78	n = 68	n = 182		

* $p < .001$

TABLE 24

Parent Question: Is your son/daughter taking any prescribed medication now?

No	Yes
1	2

	LD	LA	NA	Overlap	
Parent $\bar{X}$	1.065	1.045	1.158	LD & LA	Yes
Response SD	0.248	0.208	0.366	LD & NA	Yes
(Sr. High) Range	1 - 2	1 - 2	1 - 2	LA & NA	Yes
	F = 4.4022*				
	n = 77	n = 67	n = 183		

*$p < .01$

TABLE 25

Parent Question: Have glasses ever been prescribed for your son/daughter?

No	Yes
1	2

If yes, does he/she now wear them?

No	Yes
1	2

	LD	LA	NA	Overlap
Parent $\bar{X}$	0.632	0.373	1.121	LD & LA Yes
Response SD	0.830	0.735	0.956	LD & NA No
(Sr. High) Range	0[1] - 2	0[1] - 2	0 - 2	LA & NA No
	F = 20.5246*			
	n = 76	n = 67	n = 182	

*$p < .0001$

[1]45 LD, 52 LA, had 73 NA glasses had never been described

TABLE 26

Variables Yielding No Significant Differences

Assessment Instrument	Question #	Variables # *
Parent		
I. Pregnancy and associated medical/ health conditions		
Number of cigarettes smoked per day	23a	48
Drinking alcohol beverages during pregnancy	23b	49
Number of drinks per week	23b	50
Non-prescribed drug taken during pregnancy	23d	52
II. Direct/related birth indices		
Mother's age at birth of child	24	53
Length of gestation	25	54
Month of birth	21	44
Day of birth	21	43
III. Childhood medical/health status		
Childhood illnesses or conditions	28	58
Accidents with loss of consciousness	30	60
Multiple frequence of accidents requiring hospitalization	31	62-63
Longterm (6 months) medication	34	68
Type of medication (frequency)	34	69-70
Hearing aid prescribed	36	73
IV. Present medical/health status		
Food group - meat/poultry	20	40
Food group - grains	20	41
Eating habits	32	64
Number of medications	33	66-67
Presently wearing hearing aid	36b	74
Youth		
Present height	1a	6
Present weight	1b	7

*as coded on Parent or Youth Assessment Instrument